

Remarks/Arguments

Claims 1, 2, 8, 10, 11 and 18 are objected to as utilizing the language "non-etchable glass," which term Examiner submits is not clearly defined. Examiner also submits that "[i]t is not clear which material could be 'non-etchable glass.'" It is respectfully submitted, however, that Applicant's specification clearly provides support for the term "non-etchable glass," and it is further submitted that potential materials for non-etchable glass are known to one skilled in the art.

Applicant's specification at p. 5, lines 6-8 discloses that "The glass material of the cladding 14 is different from that of the core 12 in that it has a higher lead content which renders it non-etchable under the conditions used for etching the core material." Moreover, Applicant's specification at p. 6., line 27 through p. 7, line 1, discloses that "In order to form the channels 32, the core 12 of the fibers 10 are removed by etching with dilute hydrochloric acid. After etching, the high lead content glass claddings 14 will remain and form the channels 32."

Thus, the specification clearly discloses that the non-etchable glass has a higher lead content than the etchable glass when dilute hydrochloric acid is the etchant. If other etchants are used, other glass material will be selected by one skilled in the art. In point of fact, one skilled in the art knows non-etchable glass materials. For example: the Sink patent 4,912,314, filed in 1989 and issued in 1990, discloses at column 2, lines 30-31 that a non-etchable glass "is a lead-type glass such as Corning Glass 8161;" and, the Scott et al. patent 5,378,955, filed in 1976 and issued in 1995, discloses at column 3, lines 7-12, that a non-etchable glass "is a lead glass type 8161."

Accordingly, for the reasons set forth above, the objection to claims 1, 2, 8, 10, 11 and 18 should be withdrawn.

Claims 1, 2, 8, 10 and 18 stand rejected under 35 U.S.C. § 102(b) as being anticipated by Sink (U.S. Patent Number 4,912,314). It is respectfully submitted, however, that the claims are allowable over the art of record for the reasons set forth below.

A rejection under 35 U.S.C. § 102 requires that all elements recited in the claim are identically set forth in a single prior art reference. The Sink patent does not disclose all elements recited in the rejected claims and, thus, the rejection over the Sink patent is improper and should be withdrawn.

Applicant's claim 1 and 2 recite a boule for use in fabricating microchannel plates; claim 8 recites a fused boule for use in fabricating microchannel plates; and claim 10 recites a microchannel plate formed from the fused boule recited in claim 8.

Applicant's claim 11 recites a method of forming a fused boule for use in fabricating microchannel plates; and claim 18 recites a microchannel plate formed from the fused boule made by the method of claim 11.

In claims 1 and 2, the unfused boule includes "a hollow glass tube formed of non-etchable glass" and it has "a plurality of flat inner surfaces." In claim 2, a plurality of optical fibers are located in the tube and a plurality of support rods are located between the flat inner surfaces and the optical fibers. In claim 8, the fibers, rods and tube are fused together to form a fused boule. In claim 11, a microchannel plate is formed from the fused boule.

The Sink patent discloses a microchannel plate including a glass packing tube having a circular interior cross-section, optical fibers and support rods. The Office Action refers to Sink's disclosure at column 4, lines 4-5 and column 3, lines 62-64 and states: "the tube 22 is adhered to the fibers 24 in fig. 3, therefore, the shape of tube 22 is changed to hexagonal from circular."

The Sink patent does not disclose a hollow glass tube having a plurality of flat inner surfaces. In the Sink patent, the unfused boule 30 is formed by a "precision inner diameter bore glass tube 22 as shown in Fig. 3" (column 2, lines 61-63), a plurality of optical fibers 10 and hexagonal support rods 24. Clearly, the glass tube 24 is not formed with a plurality of flat inner surfaces as claimed.

Moreover, there is no disclosure in the Sink patent that "the shape of tube 22 is changed to hexagonal from circular" as contended in the rejection. The noted disclosure at column 4, lines 4-5 is not a discussion of the adherence of the fibers 10, or the support rods 24, to the tube 22. At column 4, lines 4-5, the Sink patent refers to the heating of the boule 30 which has been "inserted into a lead glass envelope tube (not shown)." See column 3, lines 54-55. At column 4, lines 4-5 the Sink patent discloses that when heated, the not shown "lead glass envelope adheres to the glass tube 22 but does not form a good interface therewith" and that "the lead glass envelope is ground away after heat treatment" (column 4, lines 7-8). This disclosure has nothing to do with the interior surfaces of the tube 22 or the adhesion between the support fibers 24 and the inner diameter of the tube 22.

The noted disclosure at column 3, lines 62-64, merely discloses that the optical fibers 10, support fibers 24 and glass tube 22 fuse together. There is no disclosure that the shape of the tube 22 is changed to hexagonal from circular. There is no disclosure that the unfused boule includes a tube having a plurality of flat inner surfaces.

In view of the foregoing, the rejection of claims 1, 2, 8 and 10 over the Sink patent under 35 U.S.C. § 102 is improper and should be withdrawn.

The rejection of claims 11 and 18 over the Sink patent under 35 U.S.C. § 102 is improper for the same reasons noted above with respect to claims 1, 2, 8 and 10. Claim 11 also makes it clear that a bundle of fibers are packed with a hollow packing tube which has a plurality of flat inner surfaces. Support rods are positioned between the fibers and the flat inner surfaces and the fibers, packing tube and support rods are fused to form a fused boule. Claim 18 recites a microchannel plate formed by the method of claim 11.

Thus, claim 11 and 18 make clear that the packing tube has flat inner surfaces before fusing. The rejection's position that the shape of the tube is changed to hexagonal from circular after heating is not only unsupported by the Sink patent disclosure, it is irrelevant.

Moreover, Fig. 4 in the Sink patent shows the boule after heat-processing. As shown in Fig. 4, after heating, both the inner and outer surfaces of tube 22 are still circular in shape. Therefore, the tube has a circular inner surface both when it is unfused and after the heat-processing.

In view of the amendments and arguments set forth above, the above-identified application is in condition for allowance which action is respectfully requested. Further, in light of the fact that claims 1, 2, 8, 10 and 18 are allowable, withdrawal of the restriction requirement is respectfully requested. Early and favorable notification to that effect is earnestly solicited.

Respectfully submitted,



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